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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

TSOY, ELENA

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 01/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

09/857,210

Applicant(s)

REIHS ET AL.

Examiner

Elena Tsoy

Art Unit

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-- The MAILING DATE of this communication appears on th cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on September 19, 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☒ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6, 7, 8.
- ☐ Interview Summary (PTO-413) Paper No(s). _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

Response to Amendment

1. Amendment filed on September 19, 2001 has been entered. Claims 1-12 have been cancelled. New claims 13-31 have been added. Claims 13-31 are pending in the application.

Election/Restrictions

2. Claim 13 is generic to a plurality of disclosed patentably distinct species of support material comprising: (i) metal, (ii) glass, (iii) ceramic; (iv) plastic; (v) a composite of metal and plastic.

3. During a telephone conversation with Daniel J. Pereira on October 10, 2002 a provisional election was made with traverse to prosecute the invention of specie (i), metal support material. Affirmation of this election must be made by applicant in replying to this Office action. Species (ii)-(v) are withdrawn from further consideration by the examiner as being drawn to a non-elected invention.

4. Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Specification

5. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.)
or
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (e) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (f) BRIEF SUMMARY OF THE INVENTION.
- (g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (h) DETAILED DESCRIPTION OF THE INVENTION.
- (i) CLAIM OR CLAIMS (commencing on a separate sheet).
- (j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Claim Objections

6. Claim 13 is objected to because of the following informalities:

Claim 13, line 3, "solid blasting agents" should be changed to -- a solid blasting agent -- because later on the claim recites "the blasting agent".

Claim 13, line 3, "the support material" should be changed to -- a surface of the support material -- because later on the claims recite "the surface".

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claim 30 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification as filed discloses various polymeric materials (See page 3, line 21 - page 8, line 9) for forming hydrophobic layers. However, the specification as filed fails to describe *transparent glass* sheets or *transparent plastic* sheets.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 13-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "long" in claim 13, line 3, is a relative term which renders the claim indefinite. The term "long" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Specification as filed discloses that a period of treatment a support material with a fluid jet is *relatively long* (See specification, page 2, line 14) and gives an example of 1-minute period (See specification, page 12, lines 13-14). It is not clear from the

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specification what ranges are intended to be encompassed by this term. Is it twice the disclosed range, ten times the range, etc. Thus, without a specific definition the term is a vague and indefinite.

Claim 13, line 1, a preamble "a method for producing an ultraphobic surface" renders the claim indefinite because the method produces a hydrophobic coating not ultraphobic coating.

Claim 21, line 2; Claim 22, line 2, the term "thin" is a relative term which renders the claim indefinite. The term "thin" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Specification as filed discloses a preferred range of 10-100 nm (See specification, page 8, lines 18-19). It is not clear from the specification what ranges are intended to be encompassed by this term. Is it twice the disclosed range, ten times the range, etc. Thus, without a specific definition the term is a vague and indefinite.

Claim 24, line 1, a phrase "The ultraphobic surface obtained by a method according to claim 13" renders the claim indefinite because the ultraphobic surface is associated with a substrate coated with ultraphobic surface coating so that ultraphobic surface coating cannot be claimed per se. Ex parte Scott 66 USPQ 371. For examining purposes the phrase was interpreted as -- A coated substrate obtained by the method of claims 13 --.

Claim 25 recites the limitation "The material or construction material" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 26 recites the limitation "The method" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 27 recites the limitation "The method" in line 1. There is insufficient antecedent basis for this limitation in the claim.

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Claim 28 recites the limitation "The method" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 29 recites the limitation "The method" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 30 recites the limitation "The method" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 31 recites the limitation "The method" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. **Claims 13, 14, 16, 24, 25, 28, 29** are rejected under 35 U.S.C. 102(b) as being anticipated by Tsai (US 5,411,771).

As to claims 13, 24, 25, 29, Tsai discloses a method for producing an improved anti-stick (self-cleaning) layer on metal substrate surface (See column 1, lines 43-46) comprising roughening the metal substrate with a fluid jet containing solid blasting agents of a particle size 60-80 mesh (See Fig. 1; column 2, lines 40-57), coating the roughened metal substrate with mechanically resistant layer 11 of metal such as chromium, nickel for facilitating the attachment and bonding of a polymeric coating (an adhesion promoting layer 11) (See Fig. 2; column 2, lines

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58-60; column 4, lines 48-51) and then providing the polymeric coating of a fluorocarbon resin consisting essentially of polytetrafluoroethylene (PTFE) (See Fig. 3; column 4, lines 51-56).

The Examiner Note: particle size of 60-80 mesh is size of 177-250 microns, as evidenced by Rastelli et al (US 5,401,887, column 8, lines 36-37); the fluorocarbon resin coating consisting essentially of PTFE is hydrophobic *inherently*, as evidenced by Korach (US 4,299,675, column 1, lines 37-39).

It is the Examiner's position that since the method of Tsai for coating a metal substrate is substantially identical to claimed method the method of Tsai would produce a coated metal substrate substantially identical to a coated metal substrate produced by claimed method. Therefore, the surface of the coated metal substrate in Tsai is also ultraphobic.

As to claim 14, the fluorocarbon resin coating consisting essentially of PTFE is oleophobic *inherently*, as evidenced by Nenov (US 4,384,725, column 4, lines 39-44).

As to claim 16, the blasting agent is a metal oxide (See column 2, lines 40-41).

As to claim 28, metal substrate is iron (See column 2, lines 4-5) so that coated iron would be rust protected.

13. **Claims 13, 14, 16, 24, 25, 29, 31** are rejected under 35 U.S.C. 102(b) as being anticipated by Porter et al (US 4,125,108).

As to claims 13, 24, 25, 29, 31, Porter et al disclose a method for producing a Teflon (PTFE) layer on metal substrate surface in solar heating system (See column 3, lines 59-63) comprising roughening the metal substrate with abrasive blasting agent of aluminum oxide a particle size of 80 mesh (177 microns), coating the roughened metal substrate with an adhesion promoting primer layer; and then providing the Teflon layer (See column 9, lines 49-60).

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The surface of the coated metal substrate in Porter et al is ultraphobic for the reasons discussed above.

As to claim 14, the fluorocarbon resin coating consisting essentially of PTFE is oleophobic *inherently*, as evidenced by Nenov (US 4,384,725, column 4, lines 39-44).

As to claim 16, the blasting agent is a metal oxide (See column 2, lines 40-41).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. **Claims 15, 17-19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai (US 5,411,771) in view of DE 4132534.

As to claims 15, 17, 19, Tsai, as applied above, further teaches that the blasting agent is aluminum oxide (See column 2, lines 43-44). However, Tsai fails to teach that aluminum oxide is corundum.

DE 4132534 teaches that corundum having particle size of 4-10 microns (less than 130 microns) are suitable for roughening metal supports before coating by placing nozzles (die heads) 40-100 mm from the metal supports and blasting at pressure 3-6 bar in order to improve adhesion of the coating to the metal supports (See Abstract).

It is held that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in Sinclair & Carroll Co. v. Interchemical

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Corp., 325 U.S. 327, 65 USPQ 297 (1945). See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960) (selection of a known plastic to make a container of a type made of plastics prior to the invention was held to be obvious); *Ryco, Inc. v. Ag-Bag Corp.*, 857 F.2d 1418, 8 USPQ2d 1323 (Fed. Cir. 1988).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used corundum type aluminum particles of smaller particle size, e.g. of less than 130 microns, in a method of Tsai for roughening metal supports (other than metal cookware) before coating at various conditions including placing nozzles 40-100 mm from the metal supports and blasting the corundum type aluminum particles at pressure 3-6 bar depending on support material and the intended use since DE 4132534 teaches that corundum powder having particle size of 4-10 microns are suitable for roughening metal supports before coating in certain applications by placing nozzles 40-100 mm from the metal supports and blasting the corundum type aluminum particles at pressure 3-6 bar.

As to claim 18, it is the Examiner's position that corundum particles used for roughening metal supports are sharp-edged inherently.

16. **Claim 20** is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai (US 5,411,771).

Tsai fails to teach that the treatment time is 0.1-10 min/cm².

One of ordinary skill in the art would know that the treatment time is one of result-effective parameters in a surface roughening process.

It is held that it is not inventive to discover the optimum or workable ranges of result-effective variables by routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant process parameters such as treatment time (including claimed $0.1-10 \text{ min/cm}^2$) in a method of Tsai through routine experimentation in the absence of showing criticality.

17. **Claims 21, 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai (US 5,411,771) in view of DE 4132534, as applied above, and further in view of Toy et al (US 5,931,222).

Tsai further teaches that mechanically resistant layer 11 of chromium or nickel (See column 2, lines 63-65) having thickness of 40-90 microns is provided not only to improve the adhesion of the polymeric coating, but also to increase the hardness of the inner wall (See column 3, lines 22-25; column 4, lines 17-21). However, Tsai alone or in combination with DE 4132534 fails to teach that the mechanically resistant layer 11 can be used as thin as of 10-100 nm if used only to improve the adhesion of the polymeric coating (Claim 23), the metal can be also chosen from noble metals (Claim 21).

Toy et al teach that it is well known in the art that thin layers of various metals such as chromium, nickel, platinum, palladium, as thin as 5-1000 nm formed by vacuum-deposition, can be used to improve adhesion between metal substrates and polymeric coatings (See column 3, lines 23-40); and it is also well known in the art that choice of metal depends on polymeric coatings.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used thin metal layers (as thin as of 5-1000 nm) of various metals including layers of noble metals such as platinum or palladium, depending on a material of coating, instead of thick (40-90 micron) mechanically resistant layer of chromium or nickel in a method of

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combination of Tsai and DE 4132534 if only improvement in adhesion of the coating to be adhered to a metal substrate is desired, as taught by Toy et al.

18. **Claim 22** is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai (US 5,411,771) in view of DE 4132534 and Toy et al (US 5,931,222), as applied above, and further in view of Li et al (US 5,751,541).

Combination of Tsai, DE 4132534 and Toy et al, as applied above, fails to teach that the adhesion promoting layer is a layer of gold.

Li et al teach that it is well known in the art that coatings of some materials could be successfully fabricated only on noble metal substrates, such as platinum, or gold, and could not successfully be made on non-noble metal substrates because the resulting films yielded poor adhesion and high resistance (See column 1, lines 32-43).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a layer of gold as an adhesion promoting layer in a method of combination of Tsai, DE 4132534 and Toy et al depending on a material of coating to be adhered with the expectation of providing the desired improved adhesion of the coating, as taught by Li et al.

19. **Claim 23** is rejected under 35 U.S.C. 103(a) as being unpatentable over Porter et al (US 4,125,108) in view of Toy et al (US 5,931,222).

Porter et al, as applied above, fail to teach that a layer of a noble metal of 10-100 nm can be used instead of or in addition to the adhesion promoting primer layer.

Toy et al teach that it is well known in the art that thin layers of 5-1000 nm of various metals including noble metals such as platinum, palladium, formed by vacuum-deposition, can be used to improve adhesion between metal substrates and polymeric coatings (See column 3, lines 23-40); and it is also well known in the art that choice of metal depends on polymeric coatings.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used thin metal layers of 5-1000 nm of various vacuum-deposited metals including layers of noble metals instead or in addition to an adhesion promoting primer layer of Porter et al depending on a material of coating with the expectation of providing the desired improved adhesion of the coating, as taught by Toy et al.

20. **Claims 26, 27** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai (US 5,411,771) or Porter et al (US 4,125,108), as applied above, in view of Heck (US 3,729,292), Papst (US 3,598,631) and Suzuki et al (US 4,680,331).

Tsai (or Porter et al), as applied above, fails to teach that a method for producing anti-stick (self-cleaning) layer of a hydrophobic PTFE layer on metal substrate surface with an improved adhesion can be used for coating metal surfaces in various structures including aircrafts, vehicles, roofs, etc.

It is well known in the art that to protect metal surfaces in various structures including aircrafts, vehicles, etc., by coating the metal surfaces with a hydrophobic PTFE, as evidenced by Heck (See column 1, lines 3, 35-40), Papst (See column 1, lines 15-25) and Suzuki et al (See column 1, lines 14-17).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have coated metal substrates with a hydrophobic layer to protect various structures including aircrafts, vehicles, etc., in Heck, Papst and Suzuki et al using a method of Tsai (or Porter et al) with the expectation of providing the structures with the coating having desired improved adhesion, as taught by Tsai (or Porter et al).

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21. **Claim 30** is rejected under 35 U.S.C. 103(a) as being unpatentable over Porter et al (US 4,125,108) in view of Toy et al (US 5,931,222), as applied above, and further in view of Hoffman (US 4,495,254).

Combination of Porter et al and Toy et al, as applied above, fails to teach that a hydrophobic layer comprises glass and plastic sheets.

Hoffman teaches that certain types of glass having the proper combination of transparency and thermal expansion characteristics can be used for forming a “buffer” layer between a metal substrate and a protective layer to compensate differences in thermal expansion characteristics of the metal substrate and protective material (See column 2, lines 9-45).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used certain types of glass having the proper combination of transparency and thermal expansion characteristics for forming a “buffer” layer between a metal substrate and a coating layer in a method of combination of Porter et al and Toy et al in case of significant differences in thermal expansion characteristics of the metal substrate and coating material with the expectation of compensating differences in thermal expansion characteristics of the metal substrate and coating material, as taught by Hoffman.

22. The prior art made of record and not relied upon is considered pertinent to applicant disclosure.

Maynard, Jr. (US 5,460,661) teaches that in order to obtain good adhesion of fluoropolymer to a metal surface, the surface is sandblasted (See column 1, lines 48-67).

Hornberger et al (US 5,460,661) teaches that it is common to grit-blast a metal surface with 80-120 mesh aluminum oxide grit before applying a polymeric coating (See column 11, lines 52-54).

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Conclusion

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy whose telephone number is (703) 605-1171. The examiner can normally be reached on 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Elena Tsoy

Elena Tsoy
Examiner
Art Unit 1762

December 24, 2002